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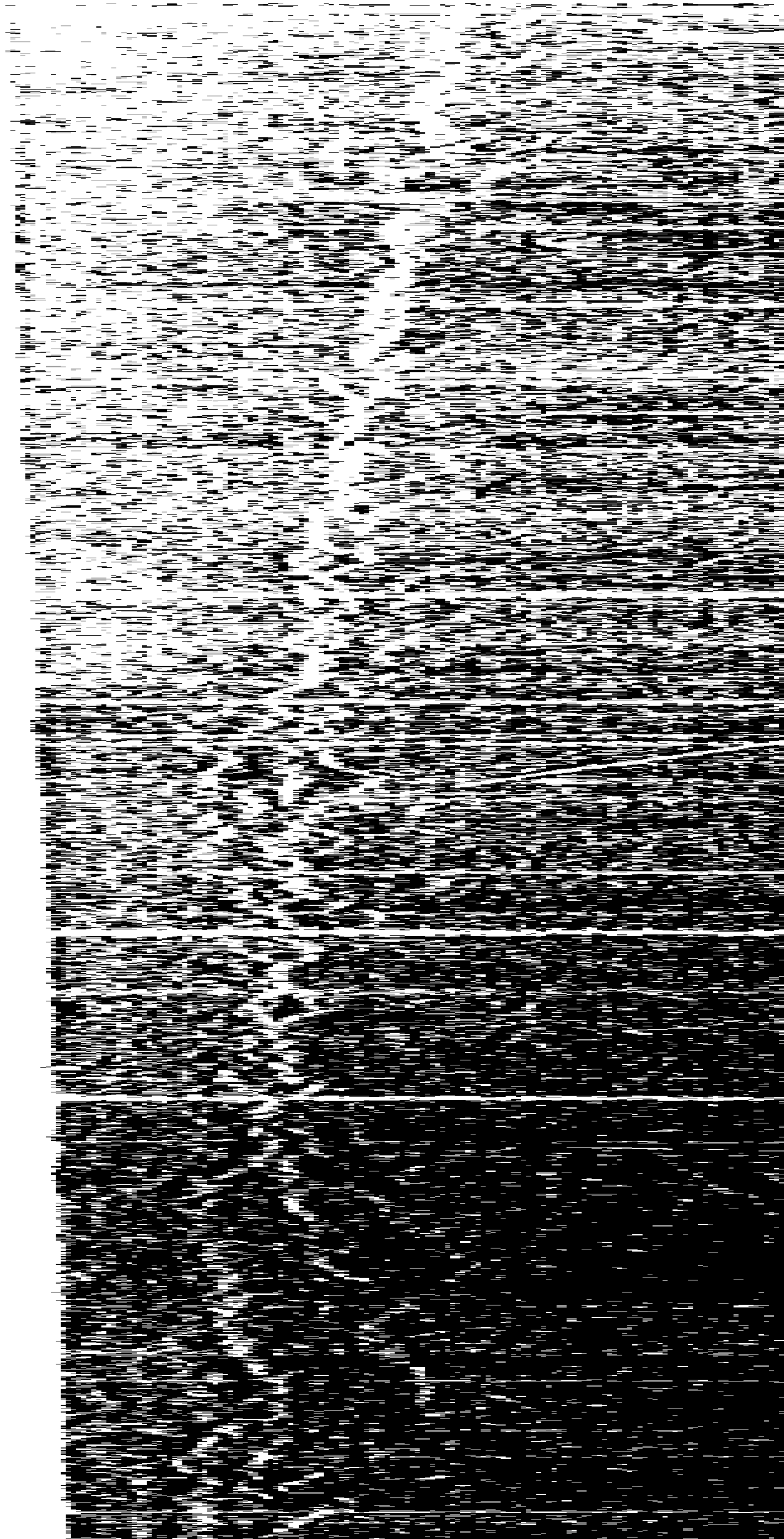
ABSTRACT

An adisciplinary, general education course for students of community colleges is outlined in this document. The one-year course was developed during two workshops, attended by representatives from community colleges throughout the country. The course is structured in modules to allow for flexibility in the sequencing of course content, and to facilitate interchange of instructional plans and materials. There are 32 modules in all. Each module outline provides general and specific objectives, and subunit topics. In addition to the more traditional environmental topics, subjects covered by these modules include: 1) the nature of man; 2) value systems--ecological priorities; 3) belief systems; 4) the myths of technology; 5) impact of political systems; and 6) impact of economic systems. A study guide to accompany the course will be available in March 1972. Miami Dade is planning to offer the course for college credit over open circuit television. (A related document is SO 001 888). (Author/JLB)



MAN AND ENVIRONMENT:

Revised Curriculum

Man and Environment is an adisciplinary course in ecological/environmental education, primarily for college freshmen and involving one academic year. It is presented in modular form.

The course was originally developed at a workshop attended by representatives from community colleges located all across the country and held in Denver, Colorado, in May, 1970.

This is a considerably revised version of that course, the subsequent work having been accomplished at a second workshop similarly attended and held in Las Vegas, Nevada, in November, 1970.

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Although these modules are published by Miami-Dade Junior College, they were prepared by faculty members from some twenty different community colleges in every region of the country. In developing these modules, participants had the assurance that their work would be subjected to only minor editing. But because so many individuals were involved in preparing this curriculum, it also means that no one person can assume responsibility for its total contents. The same is true with the sponsoring college. In publishing Man and Environment, Miami-Dade Junior College heartily endorses the concept of such a course without undertaking to subscribe to each and every concept or premise included in it.

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MAN AND ENVIRONMENT WORKSHOP

Under the sponsorship of Miami-Dade Junior College
Tropicana Hotel, Las Vegas, Nevada
November 15 - 18, 1970

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MAN AND ENVIRONMENT:

Revised Curriculum

OVER-ALL OBJECTIVE: To have students recognize man's interdependence with his environment and his responsibility for it.

GENERAL OBJECTIVES: To develop awareness and understanding of:

1. Self: Need for optimum psychological and social satisfaction
2. Nature: Psycho-bio-cultural
3. Environment: External; internal; natural; man-made
4. Change in the environment: Social institutions
5. Interdependence in the environment
6. Interaction in the environment: Psycho-bio-cultural
7. Consequences of change: Man as an ecological dominant
8. Man's responsibility for the environment: Individual, group; governmental
9. Our ecological past
10. Our obligation to future environment: Survival; the human dimension
11. Rational knowledge and the function of habits, emotions, values
12. Belief systems
13. Environmental problems
14. Alternative courses of action toward the solution of environmental problems
15. Individual involvement

ABOUT THE THEME OF THIS COURSE

There is an underlying and continuous theme to this course, which can be summed up very briefly in the following way:

Great interdependence exists between man and environment. This interdependence needs to be more deeply recognized, not only for its magnitude but also for its accompanying responsibility of man toward his environment. Involved with this increased recognition of man's responsibility toward his environment will be a heightened awareness of the need for strengthened, revised or even new solutions to problems of the environment. Where solutions do not exist, they must be found; this is imperative.

This theme is based on certain assumptions about the environment which must be recognized if the theme itself is to be appreciated One is that the environment is subject to many changes. A second is that man is an important ecological dominant. Perhaps most importantly, a third is that the environment must be recognized as encompassing much more than is conventionally associated with this term; further, it is influenced by a wider range of factors --- both animate and inanimate --- than might usually be recognized; and the ways in which man himself reacts to and handles all of this is of the utmost significance as well.

This theme and its underlying assumptions account for what may appear a remarkably broad range of problems to be included in a course entitled Man and Environment.

FOREWORD

This is a general education course for students of community colleges. It is adisciplinary in its approach. Moreover, no other education or training in environmental/ecological fields is required of the student prior to enrolling in this course.

Primarily, this course is for college freshmen. However, this need not necessarily be the case. The course is intended to cover one academic year. (The version presented here is divided into two semesters; but since it is written in modular form, it can readily be adapted to the academic year which consists of three quarters.)

This course was first developed at a five day workshop held in Denver, Colorado, in May, 1970. This workshop was attended by representatives from community colleges across the country. During the workshop, the contents of the course, its objectives, and its modules were all outlined. In addition, each module was individually developed, to the point of outlining a general statement of its contents and a somewhat more specific statement of its objectives.

In November, 1970, a four day workshop was held in Las Vegas, Nevada, to revise and expand this original curriculum. The modules contained in this report are the result of this second workshop. During these sessions, the order in which the modules had been established was revised; several modules were renamed; the objectives of all the modules were considerably revised; new material was added relating to the rationale for and the significance of each module; and the content of each module was far more completely defined than had previously been defined. Extensive bibliographies were also developed for each module.

As was the case with the original version of this course, there is nothing rigid about the sequence in which the modules occur, and faculty members using the course should feel free to make any rearrangement of the modules which they consider necessary or desirable. In fact, the knowledge that such rearrangement might be desirable was a major factor influencing the development of the course in modular form. Instructors can rearrange the order of the modules, omit certain modules if they so desire, substitute other modules in their places, or even change certain elements within individual modules themselves.

An additional objective of the modular development is to facilitate interchange of instructional plans and instructional materials. So long as development occurs within the framework of the modules, regardless of the order or number used, interchange and cooperative development can be achieved.

In conclusion, it should be emphasized again that this is an adisciplinary course. Participants in these workshops were against calling it multi-disciplinary: they felt that only the term adisciplinary adequately conveys the approach to the course which the problems of our times makes necessary.

THE FIRST SEMESTER MODULES

1. Ecological Imperatives
2. The Nature of Man
3. Value Systems --- Ecological Priorities
4. Belief Systems
5. The Myths of Technology
6. Concepts of Change
7. Earth as an Energy System
8. Environmental Perception
9. Conservation of Vital Resources
10. Population Dynamics
11. Urbanization: The Living Community
12. Water --- Supply, Demand and Pollution
13. Air Pollution
14. Food and Drug Pollution
15. Sound Pollution
16. Scenic Pollution
17. Individual Involvement

THE SECOND SEMESTER MODULES

18. Review Module

    (a) The Nature of Man
    (b) Earth as an Energy System
    (c) Conservation of Vital Resources

19. Wildlife and Man

20. Forests and Man

21. Grasslands and Man

22. Soil and Man

23. Rock and Mineral Resource Management

24. Individual Maladjustment

25. Intergroup Tensions

26. Social Institutions

27. Impact of Political Systems

28. Impact of Economic Systems

29. Communication: Dissemination and Acquisition of Information

30. The Antecedents of Contemporary Problems and Solutions in Ecology

31. Individual Involvement

32. Responsibility to Future Generations

BIBLIOGRAPHY

Participants in the workshop which developed this revised version of Man And Environment brought with them to these sessions bibliographies for each module. These are now being edited and assembled, and they will be issued as a companion report to this one which contains the modules themselves.

FIRST SEMESTER

ECOLOGICAL IMPERATIVES

OBJECTIVES

1. To acquaint the student with ecology at four levels of involvement: personal, regional, national, international, through the use of several well defined case histories.

2. To help the student recognize his responsibility for participation at all levels.

3. To realize that environmental interrelationships are not easily quantifiable but can be subtle and complex.

4. To demonstrate to the student that adverse environmental changes have immediate impact and/or cumulative effect on the well being of the individual.

5. To help the student understand the nuances of regional regulations, laws, statutes, and local ordinances.

OVERVIEW

This module would attempt to convey (1) a clear understanding that man is an inseparable part of a system composed of men, culture and the natural environment, and that man's technology alters the interrelationships of this system; (2) an appreciation of the environment, both natural and manmade; (3) a fundamental knowledge of the problems confronting man, ways to solve these problems, and the need for citizen and governmental partnership in working out solutions, and (4) attitudes, ethical standards, and behavioral patterns which will foster citizen commitment and action to overcome the environmental crisis and to improve the quality of life in the 70's and 80's.

UNITS

1. Ecology

   a. The individual
   b. The habitat
   c. The niche
   d. The population
   e. The community
   f. The city
   g. The state
   h. The country
   i. The world

2. The Physical Environment

   a. The spatial concept
   b. Proxemics
   c. Spatial Diffusion

3. Environmental Changes

   a. Historical
   b. Contemporary
   c. Predictive

4. The Law

   a. Tradition
   b. Environmental Legislation
      1) Community
      2) Regional
      3) National
      4) International

5. Man's Involvement

   a. Personal
   b. Social

6. Ecological Perspectives

THE NATURE OF MAN

OBJECTIVES

1. To develop a knowledge and awareness of man's biological nature.
2. To recognize that man is not unique with respect to his use of energy, and employment of physical, biological and chemical processes.
3. To accept that man is the ecological dominant. By virtue of this, he is the greatest single modifier of the environment.
4. To develop a knowledge and awareness of man's social behavior.
5. To recognize the interrelationships between man's biological and social nature as they pertain to the environment.
6. To understand that success of behavioral models is determined by compatibility with environment.

OVERVIEW

This module is intended to provide an understanding of the biological and behavioral nature of man. Having evolved as a product of a unique environment which has continually changed, the importance of man's relationships to his environment (habitat) is emphasized. Because man is the ecologically dominant species, his attitude and behavior towards the use of the environment are crucial to his future success.

UNITS

1. The Organism

   a. The Cell --- Unit of Life
   b. Harmful effects on life
   c. Potential hazards to life

2. The Ultimate Consumer

   a. Needs
   b. Wants
   c. Exploitation
   d. Limited supply

3. Social Interactions

   a. Taxonomy
   b. Group decision-making concerning environment

4. Primacy of Environment

   a. Adaptability
      1) Behavioral
      2) Biological
   b. Models of behavior
      1) Ghetto --- ghetto decision making
      2) Areal spatiality
      3) Reproduction

VALUE SYSTEMS --- ECOLOGICAL PRIORITIES

OBJECTIVES

1. To show that man is a part of the biosphere.
2. To illustrate contemporary examples of the chaotic present.
3. To identify historical antecedents of the chaotic present.
4. To suggest alternative paths to an ecologically sound future.
5. To recommend humane priorities which might lead to a desirable alternative future.
6. To suggest alternative learning situations where the student and teacher together might discover insights into ecological awareness --- past, present and future.

OVERVIEW

This module is designed to show that at the base of our present chaotic world situation there lies a deeper crisis --- a value crisis. In order to describe and make this relevant to the present generation of students, it is necessary to begin where they and we are (in the chaotic present), and illuminate or highlight pertinent examples of this chaos and then to search for historical antecedents, relating these to the present and suggesting alternative paths toward an ecologically sound future.

UNITS

1. Chaotic Present (Where We Are Now)
    a. Man vs. nature
        1) Pollution of environment
        2) Loss of reverence for life
        3) "We have met the enemy and he is us" --- man's egocentrism

b. Traditional values in a changing society
    1) Property rights and land use practices
    2) Religious roots of our ecological crisis
    3) Changing role of the family
c. Humanism vs. technology
    1) The human being vs.
        a) Computer
        b) Assembly line
        c) Bureaucracy
        d) Transportation
        e) Mass communication
d. Individualism vs. the community
    1) The individual's responsibility to:
        a) Himself
        b) The community
    2) The community's responsibility to:
        a) Itself
        b) The individual
e. Gross national product vs. gross national costs
    1) Traditional definition of gross national production
    2) "Real" gross national costs of:
        a) Urban renewal
        b) Interstate highway system
        c) Suburbia
        d) A high-rise structure --- business and apartments
f. Violence vs. civility
    1) Personal and collective effects of international, national and local violence
    2) Expectations of civilized individuals

2. Historical Antecedents (Where We Have Been)

a. Selected phenomena which relate to the chaotic present
b. Evolution of value structures
    1) Religion
    2) Dualism

3. Uncertain Future (Where Are We Going?)

a. Man as part of the whole organism
b. An examination of value priorities

BELIEF SYSTEMS

OBJECTIVES

1. To recognize man's traditionally anthropocentric view of his environment.

2. To identify man's historical rationale concerning his unrestricted utilization of his environment.

3. To explore the attitudes of those societies exhibiting a compatibility with environment.

4. To examine the alternative to those beliefs which are presently incompatible with a harmonious ecosystem.

OVERVIEW

The tradition of man as the ecological dominant characterizes the views of many societies. Much of this is predicated on the historical direction taken by man in his formulation of institutions to deal with his environment.

UNITS

1. The Historical Perspective

    a. "Survival of the fittest"
    b. Biophysical nature of man's earliest existence
    c. Environment as a "supplier" of man's needs

2. Economic Perspective

   a. Environment meeting minimum needs
   b. Environment producing surplus over man's minimum needs

3. Ethical Perspective

   a. Justification for man's use of environment
      1) Religion
      2) Tradition
      3) Deterministic views
      4) Political
   b. Impact on environment as a result of man's ethics

4. Man No Longer the Ecological Dominant

   a. Diminishing probability of applicable alternatives
   b. Resultant consequences of the belief that man is the ecological dominant

THE MYTHS OF TECHNOLOGY

OBJECTIVES

1. To define technology and relate it to such areas as science, industry, government and family unit.
2. To identify and examine examples of "myths".
3. To enable existing myths to be discovered and identified in the community.
4. To define growth and identify examples of it.
5. To develop a questioning attitude and a critical faculty for analysis of myth and reality in the modern industrial - technological society with respect to environmental problems.
6. To study how to use some of the existing myths in our society for the improvement of the environment.

OVERVIEW

This Module presents a definition, discussion, examination and analysis of myths of technology. It attempts to develop a questioning and an analytical attitude toward statements which are indeed "myths". Strategies of using technology and the myths in a positive way with regard to environmental problems are considered.

Economic growth increases material wealth, but it has a growing number of unfortunate side effects - each individual tries to increase his own benefits within an increasingly crowded environment. Growth is as deeply entangled in our economic thinking as rain dancing is in other societies.

Too often progress has been equated with growth, change, exploration rather than a real improvement in the quality of life.

Technology has the wherewithall to reduce the degradation of the environment. How industry can be made to do this with least disruption to mankind is the question.

UNITS

1. Definition and Description of Technology Related to Specific Areas

   a. Science
   b. Industry
   c. Government
   d. Family Unit
   e. Individual

2. Description and Analysis of Myths of Technology

   a. What's good for business is good for the country
   b. The oceans will feed us
   c. Technology will solve all problems
   d. Decentralized government is the answer to environmental problems
   e. Man is apart from his environment
   f. More government will better solve environmental problems
   g. Increased consumption is related to quality
   h. Automation makes more jobs

3. "Theology" of Technology

   a. Growth vs. the Quality of Life
      1) Is widespread acceptance of unlimited growth suited to human survival?
      2) Who owns the environment?
      3) "Who is the enemy?" Who will pay the price?
   b. Are the most fundamental needs of mankind derived from the environmen or technology?
   c. Retreat from technology?
      1) Consideration as a strategy
      2) Cooperative inputs from various agencies on directions of technology

4. Examine Some of the Strategies of Using Technology for Positive Action With Regard to Environmental Problems

   a. Industry
   b. Government
   c. Scientific Community
   d. Family Unit
   e. Individual

CONCEPTS OF CHANGE

OBJECTIVES

1. To attempt to identify any unchanging condition in the following:

    a. Himself
    b. His family
    c. Society
    d. The world
    e. The universe

2. To observe two or more kinds of change.

3. To make a comparative systematic analysis of the rate and predictability of change in one of the kinds of change mentioned in Objective 2.

4. To identify the consequences of change.

5. To study the rationale of human resistance to change.

OVERVIEW

This module is designed to demonstrate to the student the inconstancy of the physical and the living environment. He is expected to identify some of the types of change and to select one of these types for an in-depth comparative study of the factors effecting change and the consequences to be expected from such change.

UNIT

1. Change

    a. Growth and Development
    b. Personality
    c. Socialization (Acculturation)
    d. Enculturation
    e. Dynamics of the universe

2. Types

    a. Natality and Mortality
    b. Agricultural Revolution
    c. Urban Revolution
    d. Industrial Revolution
    e. Evolution
        1) Biological
        2) Physical
        3) Cultural

3. Systematic Analysis of a Change

    a. Variables
        1) Time
        2) Geography
        3) Philosophy
        4) Society
    b. Predictability

4. Results

    a. Reversible Effect
    b. Irreversible Effect

5. Reaction

    a. Conditioning
    b. Learning
    c. Tradition
    d. Status quo

EARTH AS AN ENERGY SYSTEM

OBJECTIVES

1. To consider the Earth as an open or closed energy system.
2. To appreciate the implications of the first and record laws of thermodynamics as they relate to ecosystems.
3. To understand the rapid use of our potential energy source (fossil fuels) - the rate of energy expended exceeds the energy accumulation.
4. To consider and understand that pollution is a consequence of energy expenditure.
5. To consider the need of man to explore new energy sources and the possible consequences resulting from this usage.
6. To understand the wise use of available energy.

OVERVIEW

The following is a direct quote from: Resources and Man, Committee on Resources and Man, Natural Academy of Sciences, Natural Research Council, W. H. Freeman & Company, 1969, Page 157.

"Into and out of the earth's surface environment there occurs a continuous flux of energy, in consequence of which the material constituents of the earth's surface undergo continuous or intermittent circulation. By far the largest source of this energy flux is solar radiation, a small fraction of which is captured by the leaves of plants and stored as chemical energy. This chemically stored solar energy becomes the essential biological energy source for the entire animal kingdom. In particular, it supplies the energy required as food for the human population.

During geologic history, a minute fraction of the organic matter of former plants and animals became buried in sedimentary sands, muds, and limes, under conditions of incomplete oxidation. This has become the source of our present supply of fossil fuels --- coal, petroleum and natural gas."

UNITS

1. Solar Radiation - the Earth's Primary Energy Source

   a. Energy receipt by latitude
      1) Energy surplus and energy deficit by regions
      2) Energy transfer to create the balance by planetary circulation system
   b. Upsetting factors in energy receipt and distribution.
      1) Increased low atmosphere particulate matter as a consequence of rapid use of fossil fuel.
      2) The "Greenhouse effect"

2. Energy Flow Through the Ecosystem (Food Chains)

   a. Producer populations
      1) Aquatic
      2) Terrestrial
   b. Productivity as determined by geographic distribution
   c. Consumer populations
      1) Primary consumers
      2) Secondary consumers
   d. Ecological Pyramid
      1) Increase in entropy

3. Pollution Consequences Due to Accelerated Expenditure of Fossil Fuels

   a. Fossil fuel accumulation over time
   b. Measure of the standard of living and fossil fuel consumption
   c. Effects of particulate matter (by product of fossil fuel consumption)
      1) Effects of productivity in green plants and extension along the food chain.
      2) Health implications

4. Alternative Sources of Energy and the Wise Use of Present Energy Sources

   a. Recycling
   b. Efficient conversion of energy sources.
   c. Solar radiation - economically feasible?
   d. Atomic Energy - ecologically feasible?
   e. Other possible energy sources.

ENVIRONMENTAL PERCEPTION

OBJECTIVES

1. To make the student aware that his own perception of his environment is the only reality for that individual.

2. To make the student aware that resources become resources only when the culture perceives them as such.

3. To develop a knowledge and understanding of the impact of cultural bias on man's perception of the environment.

4. To make the student aware of the disparities in the ecological perspectives between the different sub-cultures and the need for a search for workable denominators.

5. To make the student aware of the imperative need for involvement of international agencies in seeking a lessening of existing inconsistencies regarding attitudes about the environment.

6. To make the student aware of the need for involving citizenry, commercial-industrial interests, and governments in seeking commonalities in perception of the environment.

7. To orient the student's concept of a balanced ecosystem as an environmental optimum.

8. To help the student toward the realization that man can redirect his energies towards modifying his life styles so that they are more compatible with nature.

OVERVIEW

Humanity, as groups or even individuals, perceive their environments in terms of historic-cultural inputs. These inputs are based on the state or stages of technological development at that point in time. The Stone Age Indian of most of North America at the time of European discovery perceived the

land as a "happy or not so happy hunting ground". The modern technologically-oriented national planner perceives the same continent as a vastly more complex closed energy or ecosystem. Every stage in an increasing complex technology causes earth materials to have a new value as natural resources. The frontier attitude of "me-first, last and always" may not be a viable philosophy for further inhabitance of this "small space ship" called Earth.

Within a modern technological culture, it is necessary for all inhabitants of such a culture to appreciate this "small space ship" concept towards all resources and consumables needed for continued living on this earth.

UNITS

1. World Inhabitance Patterns As Examples of Cultural Bias

   a. Comparison of two world areas similar in physical environments
      1) China and southeast U.S.
      2) Nevada desert and Tarim basin
      3) California and the Mediterranean area
      4) Scandinavia and N.W. North America
   b. Comparison of two life styles in the American scene
      1) Hillbillies vs. Metropolitan denizen
      2) Plains Indian vs. forest-dweller
      3) Frontier mentality vs. space-age reality

2. The Modern Concept of a Natural Resource

   a. Resources are appreciated only in proximity of their recognized need
      1) Mesabi iron range to the Indian culture and to present American culture
      2) Uranium ore before the A-bomb
      3) Water to the frontiersman as compared to modern industrial societies
      4) Clean air to frontiersman compared to present day

3. Ethnic, Religious, Economic and Political Factors in Biasing Environmental Perception

   a. Israel vs. U.A.R. in perceiving the desert (religious)
   b. Laplanders vs. affluent sportsman's attitude toward elk and caribou (ethnic)
   c. Cattleman vs. sheepherders in terms of their attitude about ranges (economic)
   d. The sale of public land to vested interests as opposed to conservation concern (political)

4. Educative Techniques As Methods for Appreciating Commonalities in Perceiving the Environmental Degradation or Enhancement

   a. Television, radio
   b. Classroom
   c. Symposia dialogs
   d. Others

5. Appreciation of the Optimum Environment As Balanced, Closed Ecosystem Dependent on Recycling

   a. We are all passengers on a small space ship - limited essentials
   b. Balanced aquarium as model
   c. Islands uninhabited by man as model
   d. Space capsule as imperfect model

6. Harmony Between Technology and the Environment

   a. Pollution abatement technique
   b. Recycling of consumable resources
   c. Prevention vs. treatment

CONSERVATION OF VITAL RESOURCES

OBJECTIVES

1. To develop an awareness of the fact that "conservation" implies maintenance, preservation and regeneration of vital resources.
2. To define what constitutes a vital resource.
3. To identify principal categories of vital resources.
4. To identify those vital resources which are non-renewable (non-living).
5. To identify these vital resources which are renewable (non-living).
6. To identify those vital resources which are self-regenerative (living).
7. To illustrate the interrelationships between categories of vital resources (since substances vital to life often occur in cyclic or other relationships between the living and non-living aspects of the environment).
8. To observe man's role in the total conservation pattern --- including sociological, technological, biological, political, and economic aspects of vital resources management.

OVERVIEW

Vital resources may be categorized as being either renewable or non-renewable. This represents a continuum rather than a dichotomy. If man is to survive as a species with a life style commensurate with todays standard of living, he must be aware of the resources essential to himself. These resources may be living or non-living; renewable or non-renewable; regenerative or reusable. When making an intelligent decision regarding the conservation of a vital resource, man must be able to recognize the interrelationships of the vital resources in the terms mentioned above. In addition, man must also be aware of the many social, political, economic, and healthful implications involved when he makes a decision of this kind.

UNITS

1. Classification of Matter as Related to Vital Resources

   a. Abiotic or non-living matter
      1) Nonrenewable resources --- those that are limited and will not be replaced by nature.
         a) Fossil fuels such as natural gas, coal, petroleum, etc.
         b) Minerals and ores
         c) Others
      2) Renewable resources --- those that can be purified, reclaimed, reused, or in some other manner can be restored to usable quality by either natural or technological mechanisms
         a) Water
         b) Air
         c) Soil
   b. Biotic or living resources
      1) Extinction of species
         a) Natural extinction
         b) Unexplainable extinction
      2) Living species
         a) Plant communities --- trees, grasslands, etc. which are important both ecologically and economically.
         b) Animal communities --- those which are both ecologically and economically important.
   c. Cyclic relationship of vital substances between the living and the non-living worlds.
      1) Water cycle
         a) In nature (evaporation, condensation, precipitation)
         b) Man's influence upon the cycle
      2) Carbon - oxygen cycle
         a) Relationship between photosynthesis in green plants and respiration in plants and animals.
      3) Nitrogen cycle
         a) Atmosphere and soil as reservoir of nitrogen
         b) Soil bacteria, green plants and animals in the nitrogen cycle
   d. Non-cyclic relationships of resources
      1) Formation of fossil fuels
      2) Formation and use minerals and ores
      3) Transfer of materials from earth to oceans
      4) Others

2. Energy as an "Open System"; i.e., a One Way Flow Through the Environment

   a. Energy must be expended to sustain life
      1) Energy obtained from the breakdown of carbon compounds during respiration.
      2) Burning of fossil fuels.
   b. Flow of energy through ecosystems
      1) The sun (solar energy) as the primary source
      2) Green plants convert solar energy into food energy through photosynthesis
         a) Fossil fuel formation of the past
         b) Green plants as the base of all food chains in nature
      3) Passage of energy from animal to animal in food chains
      4) Man's part in burning fossil fuels

3. The Intelligent Management of Resources

   a. Man's awareness of danger signals or cues that vital resources are jeopardized
      1) Examples of the signals
      2) Some examples or case histories such as the depletion of uranium ore, natural gas, etc.
   b. Specific recommendations to reduce the rate at which resources are being depleted or are made less useable
      1) Recycling or reuse of resources
         a) Metals
         b) Glass
         c) Paper
         d) Others
      2) Reclamation of resources
         a) Water
         b) Soil
         c) Air
      3) Substitution of less limited resources
         a) Synthetic building materials in place of timber
         b) Use of solar or nuclear energy in place of the combustion of fossil fuels
         c) Others
      4) More efficient use of resources
         a) Eliminating or treating industrial wastes
         b) Other technological advancements for efficiency
   c. Solutions vs. alternatives - most deliberate efforts will be aimed at providing more ecologically sound alternatives rather than complete solutions
      1) Political implications
      2) Economic implications
      3) Social implications
      4) Biological or ecological implications

d. Man as a resource manager
   1) His past on historic record
   2) His present status
   3) Possibilities for the future
   4) Effects on the standard and quality of life

POPULATION DYNAMICS

OBJECTIVES

1. To make the student aware that overpopulation is the underlying cause of our environmental problems.
2. To give the students an overview of the history of human population growth.
3. To determine the limiting factors of population dynamics.
4. To determine the human constraints to effective population regulation.
5. To suggest effective measures for limiting populations.

OVERVIEW

The world's population, which was approximately 3.5 billion in 1969, increases about 2% every year. If it continues at this rate, the world population will double by the year 2000. Our present population increases by 180,000 daily -- or more than 65 million a year. Half of the population now living on earth has been born since the end of World War II (1945).

The magnitude of the problem arising from this unprecedented multiplication of the human species has stirred the concern of thinking people everywhere. The expansion in world populations, projected for the remainder of this century, is staggering. The impending disaster, foretold by these statistics, decries the immediate concern of the world's approximate 3.6 billion.

UNITS

1. The Problem

   a. Demographic statistics
   b. Projections

2. Historical Perspectives

   a. Changing Conditions
      1) Agricultural
      2) Industrial
      3) Medical

3. Limiting Factors

   a. Relative determinants
      1) Famine
      2) Disease
      3) War
      4) Natural catastrophes
      5) Psychological
   b. Absolute determinants
      1) Space
      2) Energy
      3) Nonrenewable Mineral Resources
      4) Water
      5) Food

4. Human Constraints

   a. Religious philosophies
   b. Political philosophies
   c. Economic philosophies
   d. Individual philosophy

5. Control

   a. Natality
      1) Contraception
      2) Abortion
      3) Abstinence
      4) Homosexuality
   b. Mortality
      1) Euthanasia
      2) Abortion
      3) Infanticide
      4) War
   c. Genetic Counselling

URBANIZATION: THE LIVING COMMUNITY

OBJECTIVES

1. To identify the nature of the urban crisis.
2. To identify the factors which have caused populations to gravitate to the urban area.
3. To describe the consequences of urbanization.
4. To investigate the methods employed to improve the urban environment.
5. To illustrate the interaction and dependency of the urban area with other urban and non-urban areas.
6. To compare, contrast, and evaluate various land development philosophies.
7. To involve the student in the evaluation and possible redesign of his own city.

OVERVIEW

Cities are developed by man in response to his needs and become resource magnets. Availability of hard goods, food, water supply, and security have further centralized populations.

The population magnet may create over-crowding, a depletion of resources, waste and sewage management problems, proliferation of disease, and most importantly the diminishing of the human spirit.

Various approaches to the urban crisis are presented and evaluated.

UNITS

1. Nature of the Urban Crisis

   a. Historical antecedents of the modern city
   b. Consequences of this historical development

2. Factors Causing Urbanization

   a. Jobs
   b. Security
   c. Convenience of goods and services
   d. Lure of the city
   e. Geographic considerations

3. The Negative Consequences of Urbanization

   a. Overcrowding
   b. Suburbanization
   c. Increase in crime
   d. Increase in transmissability of disease
   e. Solid waste and sewage disposal
   f. Transportation problems
   g. Air and water pollution

4. Positive Consequences of Urbanization

   a. Rapid assimilation of ethnic groups
   b. Cultural advantages
      1) Theater
      2) Museums
      3) Libraries
      4) Parks
   c. Proximity of health care facilities
   d. Socio-economic mobility (upward)

5. Methods for Improving the Urban Environment

   a. Housing - Urban Renewal
   b. Master planning (social & physical factors)
   c. Sector planning (social & physical factors)
   d. Relocation of people

6. Interaction Between Urban-Urban and Urban-Non-Urban

   a. Regional planning
   b. The megalopolis
   c. Shared services and facilities
   d. City as consumer of rural productivity

7. Alternative Land Development Philosophies

   a. Green Belt Concept
   b. Wagon Wheel Concept
   c. The Industrial Park
   d. Multi-vs. Single Family Housing
   e. The Mall Concept

8. Student Project

   a. To evaluate the student's city of residence
   b. To develop a new design of the city

WATER --- SUPPLY, DEMAND AND POLLUTION

OBJECTIVES

1. To define the problem of water supply, demand and pollution.
2. To develop an awareness of and concern for the problems involved in the above item.
3. To identify the natural water cycle.
4. To identify man's uses of --- and thereby, his effect on --- the natural water cycle.
5. To develop an ability to recognize and define local problems.
6. To develop an awareness of various means of eliminating the problems identified in this module.

OVERVIEW

This module deals with water --- supply, demand and pollution. It is designed to bring into awareness the factors causing the problem; methods of defining the problem; the scope of the problem; and the means of alleviating the problem.

The module is so structured that instructor and students progress as follows: (1) The problem identified; (2) Presentation of basic information for understanding the problem; (3) A commitment engendered in and by the student that the problem must be solved; (4) Appropriate involvement on the part of the student in which he translates his concern into action.

UNITS

1. Presentation of Problems

    a. Local
    b. Regional
    c. State
    d. National
    e. Global

2. The Natural World of Water

    a. Natural water cycle
    b. Natural water quality

3. Uses and Abuses of Water (Individual, Private and Public)

    a. Local
    b. Regional or state
    c. National
    d. Global

4. Solving Pollution Problems

    a. Supply and demand
    b. Management
        1) Recycling
        2) Legislation
        3) Informed discussions and choices (citizen-consumer)
        (With local solution comes national solutions)

AIR POLLUTION

OBJECTIVES

1. To develop an awareness of and concern about air pollution.
2. To give the student an insight into the biologic role of normal atmospheric components.
3. To identify atmospheric pollutants.
4. To understand the meteorologic conditions influencing pollution.
5. To understand the effects of air pollution and their mechanisms.
6. To understand methods of control.
7. To involve the students in the recognition of air pollution problems and the implementation of various courses of action.

OVERVIEW

The acute effects of urban air pollution are well documented by extensive studies of air pollution disasters. The intermittent and sub-threshold effects await further evidence, however air pollution control should be immediately pressed and not await full illucidation of pollutant effects and mechanisms of action.

Community pollution control eminates from individual concern and individual action. The student should be made aware of the necessity for his participation in the implementation of air pollution control.

UNITS

1. Classic Episodes

   a. Meteorologically Related
      1) London, 1952
      2) New York, 1966
      3) Denora, Pa., 1948
   b. Industrial Accident Related
      1) Poza Rica, Mexico, 1950
      2) Other
   c. Chronic and Intermittent Exposure
      1) Los Angeles - New York, Smog
      2) Tokyo-Yokohama - Asthma studies
   d. Local Air Pollution Problem

2. Biologic Role of Normal Atmospheric Components

   a. Oxygen
      1) Aerobic
      2) Microaerophilic
      3) Anaerobic
   b. Nitrogen
      1) Nitrogen Cycle
   c. Carbon Dioxide
      1) Carbon Dioxide Cycle
   d. Other

3. Types of Atmospheric Pollutants

   a. Combustion Process
      1) Ideal End Products - Carbon Dioxide and Water Vapor
         a) Possible climatic changes
         b) Oxygen consumption
   b. Incomplete Combustion Products
      1) Hydrocarbons
      2) Impurities
         a) Particulates
         b) Lead
         c) SO_2
   c. Associated Reactions
      1) Nitrous oxides and ozone
      2) Photochemical Smog
      3) Aerosol Formation
   d. Heat Wastes

4. Sources of Atmospheric Pollutants

   a. Industrial Related
   b. Transportation Related
   c. Fossil Fuel Combustion
   d. Open-Burning Related
   e. Agriculturally Related

5. Meteorological and Climatic Conditions that Influence the Accumulating, Dispersing, and Circulation of Atmospheric Pollutants

   a. Thermal Inversion
   b. Anti-cyclonic Weather
   c. Fog
   d. Sunshine
   e. Rain Fall
   f. Particle Fallout

6. Pollution Effects and their Mechanisms

   a. People
      1) Eye Irritation
      2) Lung Irritation
         a) Particulates
         b) Aerosols
         c) Gases
      3) Stomach
         a) Swallowing of particulates trapped in mucous
      4) General Toxic Effect
         a) Carbon Monoxide
         b) Hydrogen Sulfide
         c) Heavy Metals
      5) Animals
      6) Plants
      7) Materials
      8) Visibility
      9) Resources
      10) Climate
      11) Economics

7. Methods of Control

   a. Mechanisms of Controls
      1) Stationery
         a) New raw materials
         b) New processes
         c) New methods of containing effluents
         d) Plant location and design
            (1) Cultural Patterns
            (2) Meteorological
            (3) Topographical
            (4) Stack design

2) Mobile
   a) Better internal combustion systems
   b) Better fuels
   c) Abandon the internal combustion engine
   d) Public transportation

b. Implementation of Controls
   1) Individual
   2) Industrial
   3) Transportation
   4) Agriculture
   5) Government
      a) Federal
      b) State
      c) Local

FOOD AND DRUG POLLUTION

OBJECTIVES

1. To acquaint students with the accelerated abuses of food by the inclusion of additives, adulterants, preservatives and pesticides.
2. To explain the detrimental implications of these pollutants through natural food chains.
3. To inform the students of the biocultural implications of medication abuse.
4. To investigate various points of view in regard to the issue of food and drug pollution.
5. To investigate and evaluate methods of control.
6. To involve the students in the recognition of food and drug pollution problems and the implementation of various courses of action to deal with these problems.

OVERVIEW

Certain chemical additions are generally considered prerequisite to obtaining efficient crop yields and insuring proper preservation of our food. However, other chemical additions are strictly consumer-oriented and their inclusion in our foods is questionable at best, and may indeed constitute a real health hazard. Remedial measures will involve not only experimental identification of the toxic agents, but certainly will require reconstruction of consumer attitudes with regard to the marketing and merchandizing of his foods and drugs.

UNITS

1. The Necessity for the Addition of Chemicals to Foods

   a. Preservation
   b. Pest Control
   c. Storage
   d. Pre-preparation
   e. Nutrient Additives
   f. Anti-microbial agents

2. The Questionable Addition of Chemicals to Foods

   a. Color and flavor enhancers
   b. Moisturizers
   c. Dessicants
   d. Thickeners
   e. Bleaching agents
   f. Propellants

3. The Incidental Addition of Chemicals to Foods

   a. Insecticides
   b. Weedicides
   c. Packaging contaminants
   d. Air and water exposure
   e. Food handlers

4. The Malicious Addition of Chemicals to Foods

   a. Nitrates (fresheners)
   b. Deodorizers
   c. Spoilage masks

5. The Detrimental Implications of Food Pollutants

   a. Bio-half-life
   b. Allergic and hypersensitive reactions
   c. Chemical-inter-reactions
   d. Degradation products
   e. Routes of elimination
   f. Long range implications
   g. Re-cycling via food chains
   h. Storage and refrigeration
   i. Shelf life
   j. Concept of allowable limits

6. Specific Health Hazards

   a. Chlorinated hydrocarbons
   b. Poly-chlorinated biphenyls
   c. Fluorescin dyes
   d. Antibiotics
   e. Other

7. Medication

   a. Physiological necessity
   b. Dependency
   c. Abuse

8. Viewpoints Regarding Chemical Additives

   a. Questionable view that particular additives and preservatives are harmless to the consumer
   b. Contention by growers and producers that pesticides are harmless
   c. Suggestion by the processing industry that the use of preservatives is necessary due to the growing complexities of storage, distribution and transportation of foodstuffs
   d. Analyze the apparent irresponsible marketing techniques of pharmaceutical companies regarding drugs

9. Methods of Control

   a. Identification of potential hazards by careful experimentation
   b. Self-imposed regulations by food industries
   c. Local, state and federal regulations
   d. Enforcement agencies at various levels
   e. Regulations related to imported foods and drugs
   f. Reevaluation of consumer attitudes

SOUND POLLUTION

OBJECTIVES

1. To understand the beneficial and harmful effects of sound.
2. To develop a knowledge of the anatomy and physiology of the human ear.
3. To understand the nature of sound.
4. To determine the source of sound pollution.
5. To develop an ability to use and interpret sound monitoring devices.
6. To investigate various means of abating sound problems.
7. To develop a sensitivity to sound problems.
8. To initiate public action.

OVERVIEW

Man must become aware of the possible damage which can occur to his ears due to noise pollution. An investigation of the sources of noise should be attempted in order that appropriate courses of action can be formulated. A complete understanding of the problem will require a knowledge of the physical nature of sound and the anatomy and physiology of the human ear.

UNITS

1. Effects of Sound
    a. Beneficial
        1. Music
        2. Warning Devices
        3. Sound Therapy.
        4. Communications.
        5. Other.

b. Harmful
   1) Physical
      a. Ear damage
      b. Mutagenic
      c. Unborn children
      d. others.
   2) Psychological
      a. Hallucinatory effects
      b. Endocrine side effects
         1. Adrenal
         2. Thyroid

2. Anatomy and Physiology of the Human Ear

a. Anatomy
   1) External ear
   2) Middle ear
   3) Inner ear
   4) Auditory nerve
b. Physiology
   1) Threshold levels
   2) Transmission process
   3) Transmission abnormalities
   4) Acclamation

3. Nature of Sound

a. Generation of sound
b. Wave motion and propagation
c. Speed of sound in various media

4. Sources of Sound Pollution

a. Transportation
   1) Air
   2) Land
   3) Sea
b. Industrial
   1) Construction
   2) Assembly plants
   3) Utility plants
   4) Other
c. Recreational
   1) Modern rock music
   2) Athletic events
   3) Public facilities and gatherings
      a. Bowling alleys
      b. School lunch rooms.
      c. Other

5. Use and Interpretation of Sound Monitoring Devices

   a. Amplitude
      1) Decibel levels and meaning
      2) Frequency
      3) Quality

6. Sound Abating

   a. Accoustical design of interiors
   b. Sound abating devices
      1) Ear muffs
      2) Engine mufflers (planes)
      3) Noise-free internal combustion engines
   c. Individual efforts

7. Sensitivity to Sound Problems

   a. Research on decibel emission of common sounds
      1) Interior
      2) Exterior

8. Initiate Public Awareness

   a. Communication of problem
      1) Media
      2) Public Education
   b. Action
      1) Boycott
      2) Enforced legislation at all levels

SCENIC POLLUTION

OBJECTIVES

1. To make the student aware of what constitutes scenic pollution.
2. To examine the factors causing scenic pollution and solid waste disposal problems.
3. To appreciate the harmful effects on the ecology of solid waste disposal and scenic pollution.
4. To recommend means of minimizing scenic pollution and solid wastes.

OVERVIEW

Starting with the immediate environment of his school, home, and community, the student will examine the evidences of scenic pollution and develop an awareness of what scenic pollution is, the reasons causing it, its harmful effects, and how it may be minimized or eliminated.

Emphasis will be placed on the distinctions between scenic modification and pollution as it affects man.

The role of industries in scenic degradation and inefficient use of resources will be examined and the social, psychological, economic and political implications of scenic pollution investigated.

Efforts will be made to develop alternative techniques of industrial advertising and disposal of liquid and solid wastes. These efforts will include discussion of how to change our societal patterns of throwaway packaging, and "frontier mentality" of "leave the mess behind and move on".

UNITS

1. The Nature of Scenic Pollution vs. Scenic Modification

   a. Aesthetic modification of the natural scene by certain industrial complexes.
   b. Scenic pollution as a mixture of scenic degradation and actual inefficient use of resources.
   c. Techniques of scenic modification compatible with industrial usage.

2. Psychological, Sociological, Economic Factors That Tend to Promote Scenic Pollution in a Technological Society

   a. In throwaway package syndrome of large segments of an industrial society.
   b. The "frontier mentality" still present in large segments of certain industrial societies.

3. Oil Spills, Chemical and Process Wastes, Solid Wastes (old tires, lumber etc.) as Visual Polluters of the American Scene.

   a. Impact of each on wild-life and the micro-and macro-natural world.
   b. Legislation, education, psychological modification as techniques ameliorating scenic pollution.

INDIVIDUAL INVOLVEMENT

OBJECTIVES

1. To survey specific environmental problems.
2. To study existing environmental conditions, and evaluate the quality.
3. To plan and evaluate theoretical models related to appropriate courses of action.
4. To implement the plan of action.
5. To evaluate the effectiveness of the actions taken.

OVERVIEW

This Module is intended to present the student with the guidelines by which he addresses himself to a specific problem and charges him with applying the knowledge acquired in this segment of the course, in our effort to improve the environmental condition. He is directed in such a way as to apply the scientific method to the problem, thus providing a logical frame of reference in which to work.

UNITS

1. Identification of Environmental Problems
   a. Local involvement
   b. Regional involvement
   c. National movements
2. Selection of a Problem
   a. Determining the contributing factors
   b. Establishment of the optimum condition

3. Course of Action

   a. Research and development
   b. Awareness education
   c. Ballot box
   d. Due process of law
   e. Lobbying
   f. Boycott
   g. Confrontation

4. Engagement

   a. Application of the course of action to the actual problem

5. Evaluation of Course of Action

   a. Collection and analysis of data
   b. Interpretation
   c. Conclusions
   d. Summary
   e. Recommendations

SECOND SEMESTER

REVIEW MODULE

(a) The Nature of Man
(b) Earth as an Energy System
(c) Conservation of Vital Resources

During this most recent workshop dealing with Man and Environment, it was agreed that at the beginning of the second semester, three modules previously dealt with in the first semester should be reviewed.

These three modules are: The Nature of Man
Earth as an Energy System
Conservation of Vital Resources

It may vary from one class to another as to the detail which this review will involve, but it is recommended that each of the above modules receive at least a brief review before the beginning of the other modules covered in the second semester.

WILDLIFE AND MAN

OBJECTIVES

1. To define the meaning of the term "wildlife".
2. To understand the interrelationship between wildlife and the environment.
3. To recognize the misuse of wildlife.
4. To recognize the misuse of wildlife habitat.
5. To determine social factors causing misuse of wildlife and wildlife habitat.
6. To determine the effects of man's activities on wildlife.
7. To determine the effects of man's wildlife activities on man himself.
8. To recognize man's efforts to conserve wildlife.

OVERVIEW

This module seeks to determine wildlife's place in the environment with respect to man. It is intended to show that wildlife is an integral part of man's environment, and that his activities affect the wildlife around him either negatively or positively. This module attempts to point out some of the errors that man has made in the past, and some of the losses and disasters that have occurred as a result of man's ignorance, greed, or thoughtlessness.

An attempt is made to show how man can profit from his past mistakes and strive to protect endangered species, regional and local wildlife populations, and the natural wildlife balances.

It should be noted that man occupies center stage in this module not because of any belief that the varieties of wildlife species are here to serve man. Rather, man is the central focus of this module out of recognition of his power to destroy or conserve the world's wildlife.

UNITS

1. Meaning of the Term "Wildlife"

   a. Any organism living free --- non-cultivated or non-domesticated (not limited to the traditional concepts of game species, fur-bearers and predators)

2. Interrelationship Between Wildlife and the Environment

   a. Energy flow through the ecosystem
      1) Earth as a reservoir of energy which was captured by green plants and is used by all other forms of life. Emphasis will be placed on the desirability of balancing the input and output.
      2) Pyramid of life in the community which involves producers, consumers and decomposers
   b. Reproductive potential of wildlife
   c. Environmental factors limiting populations (air, water, food, shelter, territory, fire, disease, human harvests)

3. Examples of Misuse of Wildlife

   a. Overhunting and overfishing leading to extinction
   b. Overcollecting of wild plant species leading to extinction
   c. Overprotection leading to overpopulation of a species
   d. Overcollecting for zoos, pet shops and research
   e. Inhumane treatment
   f. Predator control programs
   g. Introduction of undesirable exotics

4. Examples of Misuse of Wildlife Habitat

   a. Destruction of habitat leading to extinction (urban encroachment into wildlife areas, strip mining)
   b. Alteration of habitat leading to extinction (flood control programs, thermal pollution, chemicals)
   c. Impediments to migratory routes (dams and reservoirs, fences, above-ground pipe lines)

5. Social Reasons for Misuse of Wildlife and Wildlife Habitat --- Demands of People for Goods and Services

   a. Demands for food
   b. Demands for domestic water supply
   c. Demands for fur and skins
   d. Demands for ivory
   e. Demands for minerals
   f. Demands for electric power
   g. Demands for housing
   h. Demands for transportation
   i. Demands for recreation

6. Effects of Man's Activities on Wildlife

   a. Extinction (passenger pigeon, Carolina parakeet)
   b. Weakening of a species (Kaibab mule, deer)
   c. Strengthening of a species (mosquito, ground-running pheasant, English moths)

7. Effects of Man's Wildlife Activities on Man Himself

   a. Negative
      1) Extinction of wildlife providing loss of wildlife heritage
      2) Loss of species for scientific research that would provide insights into man as well as the specific species that are being lost
      3) Loss of wildlife-related industries (fishing, whaling, fur, alligator and crocodile skin)
      4) Health problems
      5) Loss of crops because of pests not being controlled by natural predators
   b. Positive
      1) Restoring regionally extinct species providing recreational, aesthetic and economic benefits for people
      2) Saving endangered species providing recreational, aesthetic and economic benefits for people

8. Examples of Man's Efforts to Conserve (Wisely Use) Wildlife

   a. Federal
      1) Legislation
         a) Lacey Act (1900)
         b) Migratory Bird Conservation Act (1929)
         c) Migratory Bird Hunting Stamp Act (1934)
         d) National Forest, Fish and Game Sanctuary Act (1934)

e) Wildlife Refuge Exchange Act (1935)
f) Wildlife Coordination Act (1934, amended in 1946)
g) Pittman-Robertson Act (1937)
h) Dingell-Johnson Act (1950)
i) Wetlands Loan Act (1961)
j) Wetlands Inspection Act (1962)
k) Endangered Species Act (1966)
l) Endangered Species Act (1969)

2) Treaties
   a) Migratory bird treaties: United States and Canada (1916)
      United States and Mexico (1937)
   b) North Pacific Sealing Convention (1911)
3) Federal departmental bans on pesticides
4) Department of Agriculture prohibition of logging in the national forests near the habitats of endangered wildlife
5) Wildlife Refuges, National Parks and National Monuments

b. State
   1) Game and fish laws establishing seasons and bag limits
   2) Parks and wildlife refuges
c. Private clubs and organizations working for wildlife conservation
d. Habitat improvement programs by farmers and other private land owners (shelter belts, ponds)
e. Game farms and stocking
f. Zoos
g. Fish ladders

FORESTS AND MAN

OBJECTIVES

1. To define the meaning of the terms "forest" and "forest resources".
2. To identify different forest types of the United States.
3. To understand the interrelationships within the forest communities.
4. To understand the interrelationship between the forests and the surrounding environment.
5. To recognize the misuse of forests.
6. To determine social factors causing use and misuse of forests.
7. To determine the effects of man's activities on forests.
8. To determine the effects of man's forest activities on man himself.
9. To recognize man's efforts to conserve forests

OVERVIEW

This module attempts to point out the significance of forests as a major part of man's environment.

Man has been and is now greatly influenced by the various types of forests and he, in turn, has a profound effect on forest communities. This module attempts to point out both the positive and negative aspects of this profound effect.

Also examined in this module is how man may avoid mistakes in utilizing forest resources by learning from past experience and how man can enhance the forest communities by careful scientific planning and implementation of sound forestry practices.

The wide scope of forest resources, products, and services are considered and the history of forestry practices is discussed.

While man may be in a more favorable position with respect to forest resources than he is with respect to other natural resources, constant diligence must be maintained to preserve a balance between man and his forest communities.

UNITS

1. Meaning of the Term "Forest" and "Forest Resources".

   a. "Forest" - a community of living trees and associated organisms covering a considerable area.
   b. "Forest resources" - forest products and services useful to man such as wood, water supply, oxygen, wildlife, and recreation.

2. Different Forest Types of the United States.

   a. Eastern forest types
      1) Spruce - fir (with admixture of hardwoods)
      2) Birch - beech - maple - hemlock.
      3) White, red, and jack pine.
      4) Oak - hickory.
      5) Oak - chestnut - yellow poplar.
      6) Oak - pine.
      7) River bottom hardwoods and cypress.
      8) Longleaf - loblolly - slashpine.
   b. Western forest types
      1) Spruce - fir.
      2) Pacific Douglas fir.
      3) Sugar pine - Ponderosa pine.
      4) Redwood
      5) Western larch - western white pine.
      6) Lodgepole pine.
      7) Ponderosa pine.
      8) Pinon - juniper.
      9) Chaparral.

3. Interrelationships Within the Forest Communities.

   a. Reproductive potential of a given forest type.
   b. Succession of forest types.
   c. Trees and other plants.
   d. Forests and water.

e. Forests and soil.
f. Forests and oxygen.
g. Forests and micro-climate.
h. Forests and wildlife.
i. Forests and man.

4. Interrelationships Between the Forests and the Surrounding Environment.

a. Influences of the surrounding environment on the forests.
   1) Natural factors determining forest types.
      a) Latitude.
      b) Elevation
      c) Aspect (exposure)
      d) Slope
      e) Climate (precipitation, temperature, barometric pressure, relative humidity)
      f) Fire
   2) Man's activities affecting forests.
      a) Air pollution
      b) Noise pollution
      c) Lumbering
      d) Urban sprawl
      e) Road building
      f) Damming and reservoir building.
      g) Hiking and other forms of recreation
      h) Starting and preventing fires
      i) Protecting from insect pests through chemical spraying, but upsetting natural balances through this spraying
      j) Introducing undesirable exotic species of wildlife (Gypsy moth, chestnut blight)
b. Influences of the forests on the surrounding environment.
   1) Water supply for urban man and irrigation.
   2) Electric power supply.
   3) Source of recreation for man.
   4) Climate.
   5) Oxygen - carbon dioxide cycle.
   6) Products for international trade.
   7) Basis for industries (lumber, paper, fruit, nut, rubber, maple syrup, turpentine, cork)
   8) Development of human communities around forests (Aspen, Colorado)

5. Misuse of Forests

a) Over-harvesting
b) Lack of reforestation accompanying harvesting.
c) Failure to re-cycle forest products (wood and paper).
d) Inadequate development of present and future forest recreation areas.

e) Opening of wilderness forest areas to commercial interests and to mass recreation.
f) Forest fires through arson and careless camping.
g) Ignorant opposition to scientific management programs.
h) Dam building and flooding forested areas.

6. Social Factors Causing Use and Misuse of Forests - Goods and Services for an Expanding and Increasingly Demanding Population.

a) Economic demands (wood, paper, water, electric power, recreation industries).
b) Political demands (West Virginia law prohibiting clear cutting, Colorado suit to halt logging in a wilderness area, Wilderness Act of 1965).
c) Recreational demands (Mineral King, ski developments).

7. Effects of Man's Activities on Forests

a) Destruction due to man's historical drive to tame the wilderness, clear the land for agriculture, and exploit the forests for lumber (Cut-out and get-out era).
b) Changing forest types through unplanned succession and scientifically-planned conversion.
c) Improving tree species genetically (faster growth, resistance to insects and disease, resistance to fire).

8. Effects of Man's Forest Activities on Man Himself

a) Negative - Destruction of forests resulting in a loss of man's forest-related industries (lumber, paper), sedimentation of water bodies, and loss of water-holding capacity.
b) Positive - Reforestation providing recreational, aesthetic, and economic benefits for people. Partial forest destruction opening up forests for recreational and economic benefits.

9. Man's Efforts to Conserve (Wisely Use) Forests.

a) Colonial period in American history.
   1) Pennsylvania Ordinance (1681)
   2) Broad Arrow Proclamation (1691)
b) Federal period in American history.
   1) Legislation.
      a) Forest Reserve Act (1891)
      b) Organic Forestry Act (1897)
      c) Weeks Law (1911)
      d) National Park Service Act (1916)
      e) Clarke - McNary Act (1924)

f) McNary - McSweeney Act (1928)
g) Knutson - Vanderberg Act (1930)
h) Civilian Conservation Corps. (1933)
i) Tennessee Valley Authority (1933)
j) Cooperative Forest Management Act (1950)
k) Multiple Use Act (1960)
l) Wilderness Act (1964)

2) Santa Rosa Project (1828)
3) Franklin Hough appointed Forestry Agent in the Grant administration.
4) President Benjamin Harrison sets aside the first Forest Reserves.
5) President Theodore Roosevelt and Gifford Pinchot's efforts in setting aside Forest Reserves.
6) Ballinger - Pinchot Controversy (1910)
7) State legislation and forestry departments.

c) Private efforts in forest conservation.
1) American Forestry Association (1875)
2) Commercial forest industries.

GRASSLANDS AND MAN

OBJECTIVES

1. To define the meaning of the term "grasslands".
2. To identify different grassland types in the United States.
3. To understand the interrelationships within the grassland communities.
4. To understand the interrelationship between the grasslands and the surrounding environment.
5. To recognize the misuse of grasslands.
6. To determine social factors causing misuse of grasslands.
7. To determine the effects of man's activities on grasslands.
8. To determine the effects of man's grassland activities on man himself.
9. To recognize man's efforts to conserve grasslands.

OVERVIEW

This module is built around the premise that the grassland areas of the United States (and the world) constitute a major part of the earth's environment.

Man has been, and is now, greatly influenced by the various types of natural grasslands and the cultivated farms which have replaced them. He, in turn, has had a profound effect on the grassland areas.

This module attempts to point out both the positive and negative aspects of man's conversion of natural grasslands to agriculture. Also considered in this module are man's mistakes in utilizing grassland resources and their effects on soils, waters and the American society.

The present scope of agricultural use of grassland areas and the resources, products and services provided are discussed, together with the history of land-use practices in the nation.

With increasing demands for food and other products of grassland animals by an expanding population, the emphasis is placed on maximizing use and productivity of grassland and former grassland areas, minimizing losses to insects and disease, and minimizing losses of soil and water resources.

UNITS

1. Meaning of the Term "Grasslands"

    a. A community of grasses and associated organisms (This term is inclusive of lawns in urban communities as well as extensive ranges.)

2. Different Grassland Types of the United States

    a. Short-grass land (steppe)
    b. Tall-grass land (prairie)
    c. Grass-tree land (savanna)
    d. Cultivated land
        1) Cereals
        2) Hay (meadow, pasture, lawn)

3. Interrelationships Within the Grassland Communities

    a. Reproductive potential of a given grassland type
    b. Succession of grassland types
    c. Grasses and other plants (brush species, weeds, sedges, trees)
    d. Grasses and water
    e. Grasses and soil
    f. Grasses and oxygen
    g. Grasses and micro-climate
    h. Grasses and wildlife
    i. Grasses and man

4. Interrelationship Between the Grasslands and the Surrounding Environment

    a. Influences of the surrounding environment on the grasslands
        1) Natural factors determining grassland types
            a) Latitude
            b) Elevation
            c) Aspect (exposure)
            d) Slope
            e) Climate (precipitation, temperature, barometric pressure, relative humidity)
            f) Fires

2) Man's activities affecting grasslands
   a) Harvesting
   b) Urban sprawl
   c) Road building
   d) Damming and reservoir building
   e) Starting and preventing fires
   f) Protecting from insect pests through chemical spraying (and the resulting upset of natural balances due to this spraying)
   g) Introducing undesirable exotic species of wildlife (weeds, multiflora rose, rabbits in Australia)

b. Influences of the grasslands on the surrounding environment
   1) World food supply (grains and livestock)
   2) Watershed reducing siltation of water bodies
   3) Source of recreation for man (game, bird hunting)
   4) Micro-climate
   5) Oxygen-carbon dioxide (a fifty foot square lawn produces the oxygen needed by a family of four)
   6) Products for international trade
   7) Basis for industries (alcohol, food, wool, leather)
   8) Development of human communities near grasslands (Dodge, Kansas)

5. Misuse of Grasslands

a. Overgraz[illegible]ng beyond carrying capacity)
b. Excess[illegible] of natural grasslands to crop cultivation
c. Dam b[illegible]looding grasslands
d. Introduced plant and animal pests (weeds, multiflora rose, rabbits in Australia, cattle in East Africa)
e. Excessive opening of grasslands to highways and urban development
f. Grassland fires through arson and careless camping

6. Social Factors Causing Use and Misuse of Grasslands

a. Economic demands (alcohol, food, wool, leather)
b. Political demands (parity payments and acreage reserve payments)

7. Effects of Man's Activities on Grasslands

a. Destruction due to overgrazing, creating the Dust Bowl of the 1930's in the United States
b. Changing grassland types through scientifically-planned conversion
c. Improving grass species genetically (Bermuda grass in Florida, improvement of food crop grasses by means of hybridization)

8. Effects of Man's Grassland Activities on Man Himself

   a. Negative
      1) Destruction of grasslands resulting in loss of grassland heritage and loss of grassland-related industries (alcohol, food, wool, leather)
      2) Cultivated lands in the United States making Americans overly well-fed
   b. Positive
      1) Cultivated lands that avert widespread famine throughout the world

9. Man's Efforts to Conserve (Wisely Use) Grasslands

   a. Federal
      1) Legislation
         a) Soil Erosion Service (1933)
         b) Agricultural Adjustment Acts (1933 and 1938)
         c) Jones-Bankhead Farm Tenant Act
         d) Taylor Grazing Act (1935)
         e) Soil Conservation Act (1935)
         f) Soil Conservation Act (1955)
         g) National Grasslands Act (1960)
      2) Bureau of Land Management, Land Use Capability Studies
      3) Hugh Bennett, Director of the Soil Conservation Service
   b. State land grant college programs aimed at grassland conservation
   c. Sound farming practices
      1) Crop rotation
      2) Strip farming
      3) Terracing
      4) Tree and hedge windbreaks
      5) Dry farming techniques

SOIL AND MAN

OBJECTIVES

1. To define soil resources.
2. To investigate soil types.
3. To investigate interrelationships within soil communities (with plants, animals, micro-organisms).
4. To investigate the interrelationships between soil communities and environment.
5. To recognize soil uses.
6. To recognize misuse of soils.
7. To determine social, economic, political, familial, ethnic, cultural, religious and individual factors.
8. To relate knowledge developed above to problems of immediacy as they relate to local, regional, national and global concerns; (move from local to global concerns.)
9. To relate soil concerns to the urban-suburban-rural environments.
10. To point out that the urban student (as well as the non-urban student) is intimately dependent upon soils.
11. To recognize principal efforts to conserve (use wisely) local, state, regional, national and global resources.

OVERVIEW

The student will investigate local soils through personal experience in the field, or samples and examples which have been prepared for the classroom. This gives him a background for understanding the definition of soil, and prepares him for determining the constituents of a soil. After

investigation and experience with local soils, the student may then study and compare world soil classes and types, and how they affect him personally, as well as the impact they have on various world cultures.

With this background, he may better understand the relationships within the soil community, and the interrelationships with surrounding environments. Value judgments can be developed by investigation of local and world uses of soils and soil products. Through a contemporary and historical approach, the student develops an awareness and understanding of the abuses and misuses of soil resources. Personal involvement may be put into perspective by attaining an awareness of the citizen's role with respect to social, governmental, economic, ethnic and religious factors.

The most significant concept arrived at in this module might be that of developing and implementing conservation practices in our multi-use of soils. This might come about through using a basis of the historical approach, and in turn leading to an investigation of contemporary soil conservation practices and their impact on man.

UNITS

1. Define Soil - Soil Resources

   a. Relate soils in backyard to student (on local level) and expand to world-wide concerns
   b. Provide experience to illustrate fragile, tenuous, temporary nature of soils.
   c. Identify soil resources (student will be involved)
   d. Determine local uses of soils
   e. Investigate economics of soil usage

2. Interrelationships Within Soil Communities

   a. Investigate (find and discover) flora and fauna of soils
   b. Investigate interrelationships between soil and plants
   c. Investigate interrelationships between soil and animals
   d. Compare backyard soils (one student with another)
   e. Sterilize (oven-bake) a soil sample, and compare flora and fauna before and after sterilization
   f. Investigate how man's activities effect soils
   g. Recognize (become aware of) examples of wise use and misuse of soils

3. Social Implications

   a. Reasons for man's use and misuse of soils
   b. Economics of soil use
   c. Historical uses of soils
   d. Backyard involvement

4. Effects of Man's Activities on Soils

   a. Planting
   b. Plowing
   c. Paving
   d. People
   e. Population
   f. Poverty

5. Effects of Soil Uses on Man

   a. Increasing costs for food and fiber as soils become depleted
   b. Changing community values regarding soil (land) use

6. Man's Efforts to Conserve Soils

   a. Historical - contemporary
   b. Florida encourages, California discourages orange groves
   c. Research --- practical demonstrations by government and private industry

ROCK AND MINERAL RESOURCE MANAGEMENT

OBJECTIVES

1. To define rock and mineral resources.
2. To develop in the student an understanding of the origin and occurrence of various rock and mineral resources.
3. To develop in the student an understanding of some of the processes involved in mineral exploration and recovery.
4. To understand the various uses of mineral resources.
5. To make the student aware of the significance of rock and mineral resources in world affairs and socio-economic concerns.
6. To bring about an awareness of the problems of effects of exploration mining, processing, using and disposing of the resources on our environment.
7. To bring about an awareness of the need for intelligent management of rock and mineral resource reserves.
8. To recognize and understand local rock and mineral resources, requirements and associated environmental problems.
9. To develop an understanding of the processes involved in planning and implementing of rock and mineral resource conservation and environmental control.

OVERVIEW

Rock and mineral resources are necessary to satisfy many of man's physical, biological and cultural needs, and are of great significance in world affairs. Resource demands are increasing both in amount and variety, and

have produced concomitant supply and environmental problems. These associated environmental problems occur at every stage of rock and mineral resource utilization. Consideration is given to the alternative measures available for problems of supply, and to methods of controlling the various environmental effects. The student should become aware of local rock and mineral resource utilization and involved with local problems.

UNITS

1. Importance of Mineral Resources in Local, Regional, National and World Affairs and Socio-Economic Concerns

   a. Local significance
   b. Trade
   c. International relations
   d. Cultural needs
   e. Population distribution and growth

2. Definition and Distinctions Involving Classification of Rock and Mineral Resources

   a. Low value
      1) Rocks
      2) Gravel
      3) Sand
      4) Others
   b. High value
      1) Fossil fuels
      2) Metals
      3) Radioactive ores
      4) Gems and semi-precious stones
      5) Others, e.g., asbestos, mica, etc.

3. Origin and Distribution of Rock and Mineral Resources

   a. Rock cycle
   b. Mineral relationships to rock cycles
   c. Fossil fuel formation
   d. Geographic distribution
   e. Geologic significance

4. Exploration and Recovery

   a. Development and techniques of exploration
   b. Development and techniques of recovery
      1) Mining, drilling, harvesting, etc.
      2) Refining and processing

5. Uses of Mineral Resources

   a. Power and heat
   b. Construction
   c. Manufactured goods
   d. Adornments
   e. Miscellaneous, e.g., salt, drugs, additives, etc.

6. Environmental Effects

   a. Exploration
   b. Mining (land utilization)
   c. Processing (pollution)
   d. Distributing (pollution)
   e. Using
   f. Waste disposal (solid, liquid and gaseous)

7. Problem of Non-Newable Resource Reserve Depletion

   a. Resource limitations
   b. Estimation of present reserves
   c. Rates of depletion
   d. Significance of depletion rates
      1) International relations
      2) Standard of living
      3) Local values

8. Local Implications

   a. Local sources
   b. Local needs
   c. Local processing
   d. Local problems

9. Resource Management

   a. Alternative measures to depletion problems
      1) Exploration for new reserves
         a) Deeper or more remote sources
         b) Potential of the sea
         c) Extraterrestrial
      2) Improved recovery technology
         a) Mining
         b) Processing
      3) Recycling
      4) Substitution

b. Environmental control
   1) Land use management
   2) Development and utilization of various pollution abatement measures
   3) Solid waste disposal techniques
      a) Incineration
      b) Land-fills
      c) Recycling

INDIVIDUAL MALADJUSTMENT

OBJECTIVES

1. To define the meaning of the term "individual maladjustment".
2. To identify the different forms of individual maladjustment.
3. To understand the causes of individual maladjustment.
4. To understand that all nonconformity is not maladjusted nonconformity.
5. To understand how individual maladjustment in a society influences the society as a whole.
6. To understand how the individual can deal with his own individual maladjustment.
7. To understand how societies now deal with individual maladjustment.
8. To understand how societies can work to eliminate individual maladjustment.

OVERVIEW

This module examines the nature of individual maladjustment in modern society. Various forms and causes of individual maladjustment are considered and its effects on both the individual and society are examined.

The attempt is made to consider ways in which individual maladjustment may be either eliminated or diminished in the future including a look at utopian societies.

UNITS

1. Definition of "Individual Maladjustment" - Inability of a Person to Conform to Group Norms and Customs

2. Forms of Individual Maladjustment

   a. Functional vs. non-functional
   b. Disturbed personalities (neuroses) vs. mental illness (psychoses)
      1) Disturbed personalities
         a) Schizoids
         b) Paranoids
         c) Obsessive - compulsives
         d) Depressives
         e) Hypomanics
         f) Character disorders (many criminals)
      2) Mental illness
         a) Manic - depressives
         b) Schizophrenics (many criminals)
         c) Paranoias
         d) Physical disorders
            (1) Alcohol
            (2) Syphilis
            (3) Brain damage
            (4) Drugs

3. Causes of Individual Maladjustment

   a. Hereditary - biogenic influences
   b. Environmental - outside influences from conception until death
      1) Nature - biological disease
      2) Culture and material culture
         a) Overcrowding (lemmings, sitka deer, rat experiments, studies reflecting stress conditions in urban areas)
         b) Extreme isolation (Kingley Davis's study of Anna and Isabelle, produces loneliness as does overcrowding)
         c) Rapidly changing society
            (1) Values
            (2) Institutions (family, education, religion, political system, economic system, recreation, communications)
            (3) Technology
         d) Affluence in the United States and other cultures such as West Germany and Japan (studies of Kenneth Galbraith, David Potter, and Bruno Bettelheim on Joey the Mechanical Boy)
      3) Individual maladjustment itself (some ideological opposition to the established society and some drug pushers)

4. All Nonconformity is Not Maladjusted Nonconformity

   a. Nonconformity can result from rational judgments (autonomy)
   b. Nonconformity can lead to changes for the better in the society (progress)

5. Individual Maladjustment Influences Society as a Whole

   a. By leading to social progress (Hitler's road building, Poe's literary works)

   b. By leading to social non-progress (Hitler's extermination camps for Jews, Leary's advocation of hard drugs)

6. Individual Dealing with His Own Individual Maladjustment

   a. Individual defense mechanisms
      1) Compensation
      2) Rationalization
      3) Identification
      4) Projection
      5) Reaction formation
      6) Withdrawal
      7) Aggression
      8) Repression
      9) Regression
      10) Sublimation
   b. Individual uses of group dynamics
      1) Self-insight through sensitivity training sessions
      2) Accommodation
      3) Assimilation
      4) Amalgamation

7. Means by Which Society Now Deals with Individual Maladjustment

   a. Positive means (productive treatment)
      1) Medical treatment (lobotomies, methodone treatments in drug clinics, penicillin treatment for syphilis)
      2) Psychological-educational treatment (neo-Freudian psychoanalysis, group therapy and drug information presentations in drug clinics, group therapy and alcohol information presentations in the AA, counseling and training in prisons, half-way houses for parolees, foster homes for youths)
   b. Negative means (nonproductive treatment)
      1) Certain mental institutions
      2) Certain prisons
      3) Ostracism
      4) Ridicule
      5) Aggressive physical attacks
      6) Aggressive verbal attacks

8. Means by Which Societies Can Eliminate Individual Maladjustment in the Future

   a. Understanding the true nature of man
   b. Understanding of man's environment
   c. Understanding of utopian societies
      1) Positive utopian society (Walden Two)
      2) Negative utopian society (1984, Brave New World)

INTERGROUP TENSIONS

OBJECTIVES

1. To realize that intergroup tensions exist.
2. To understand some of the causes of intergroup tensions.
3. To recognize effects resulting from intergroup tensions.
4. To explore possible avenues of lessening and/or elimination of intergroup tensions.

OVERVIEW

Intergroup tensions of various types are all about us. The causes and effects of this problems have, in turn, a profound effect on our society and our nation. Remedies must be derived to eliminate this problem.

UNITS

1. Intergroup Tensions

    a. Types
        1) Racial
        2) Nationality groups
        3) Urban renewal groups
        4) Religious groups
        5) Business - industrial
        6) International
    b. Causes
        1) Limited contacts
        2) Limited knowledge

3) Individual maladjustment
   a) Insecurity - scapegoating
   b) Resentment - displacement
   c) Inferiority
4) Conformity to others
   a) Vicious cycles of tensions (prejudice and discrimination leading to unemployed, low income, low standard of living --- development of defense mechanisms)

c. Effects
   1) On minority groups
      a) Distorted perceptions
      b) Generalized hostility
      c) Subconscious guilt feelings
   2) On society as a whole
      a) Loss of talent
      b) Loss of purchasing power
      c) Disease
      d) Cost of separate facilities
      e) Evolvement of crime
      f) Violent aggression

2. Possible Remedies

a. Education to realize the full capabilities of each individual
b. Equalization of employment possiblities
c. Elimination of sub-standard living conditions

SOCIAL INSTITUTIONS

OBJECTIVES

Social Institution: The Family

1. To study the family as the first socialization agent with which the child comes into contact.
2. To study the input-output flow of family decision-making as it influences the environment of man.
3. To study the effect of the communications media on family decision-making in the area of man and his environment.
4. To study alternatives to the family unit as a viable social arrangement.

Social Institution: Special Interest Groups

1. To study special interest groups as an agent for the socialization of the individual.
2. To study the input-output flow of special interest group decision-making as it influences the environment of man.
3. To study the effect of the communications media on special interest group decision-making in the area of the environment of man.
4. To study alternative and combative special interst groups and their effect on the establishment of priorities regarding environmental quality.

Social Institution: Economic Systems

1. To study economic systems as contributors to socialization of the individual.
2. To study the input-output flow of economic system decision-making as it influences the environment of man.

3. To study the effect of the communications media on economic decision-making in the area of the environment of man.

4. To study alternative economic systems which may provide a greater chance for a life of quality (or a greater chance for a better environment for man).

Social Institution: Education

1. To study educational systems as an agent for the socialization of the individual.

2. To study the input-output flow of educational decision-making as it influences the environment of man.

3. To study the effect of communications media on educational decision-making as it applies to the area of man's environment.

4. To study alternative educational decision-making as opposed to the traditional educational decision-making process.

Social Institution: Organized Religion

1. To study organized religion as an early agent for the socialization of the child.

2. To study organized religion as it transmits belief systems and thereby influences the ecological values of a society.

3. To study the effect of communications media on organized religious decision-making in the area of man and his environment.

4. To study alternative value systems as a substitute to religions.

Social Institution: Political Systems

1. To study the political system as an agent of the socialization of the individual.

2. To study the input-output flow of political decision-making as it influences the environment of man.

3. To study the effect of the communications media on political decision-making in the area of the environment of man.

4. To study alternative political systems and their effect on the establishment of priorities regarding environmental quality.

OVERVIEW

The scope of the module concerned with social institutions is broad and overlaps several other modules. It was approached by the group with the intention that it would serve as an introduction to these other modules --- specifically Impact of Political Systems and Impact of Economic Systems, and to some extent Belief Systems and Communication: Dissemination and Acquisition of Information.

It could be argued that the module should not stand alone, but instead be absorbed into the format of the modules mentioned above. However, it is felt by the group that the continued existence of the module as a separate entity is desirable. This is the only module designed specifically to deal with such social institutions as the family, the education system, and special interest groups. These social institutions all serve as important agents for the transmission of attitudes, beliefs, values and customs from one group to another and from one generation to another. In other words, they serve as agents for the socialization of the individual.

UNITS

1. The Family

   a. First agent for the socialization of the child
      1) Primitive family unit
      2) Traditional family unit
      3) Changing family unit
   b. Input-output flow of family decision-making as it influences the environment of man
      1) Consumption patterns
      2) Personal behavior
   c. The shaping of the family decision-making process by the communications media
   d. Alternatives to the family structure
      1) Communes
      2) Government controlled youth programs

2. Special Interst Groups

   a. Special interest groups are agents for the socialization of the individual
   b. Special interst group decision-making as it influences the environment of man
      1) Private profit motive for determining priorities
      2) Public benefit motive for determining priorities

c. Effect of the communications media on special interest groups
   1) Use of the media to appeal to the public
   2) Media influence on the public posture of special interest groups
d. Competition between special interest groups
   1) Claims made by special interest groups in government spending
   2) Claims made by special interest groups on economic priorities

3. Education System

a. Education system as an agent for the socialization of the individual
   1) Preservation of the status quo
   2) An agent for change
b. Decision-making within the education system regarding an environmental problem
   1) Input sources
      a) The extended community
      b) The board
      c) The administration
      d) The faculty
      e) The student body
   2) Impact of output
      a) Awareness education
      b) Agent for finding solutions
      c) Agent for change
c. Communications media and education system
   1) As a tool of the education system
   2) As an influence of the education system
d. Suggested changes for the future
   1) Education for the generalist
   2) The specialist and dangers of overspecialization
   3) The generalist and dangers of lacking specialized knowledge

4. Organized Religion

a. Religion provides a common belief system
b. Common belief systems provide early and continuous sustenance for the believer
c. Emphasis of religion may be on the infinite vs. the finite; this leads to an expression of the quantity of life rather than the quality of life
d. Religion which induces humanism would stress the quality of life and the environment
e. Religion has changed through the influence of media
   1) Decreased rigidity
   2) Increased activism
   3) More flexible beliefs

f. The decision-making power in religious bodies is shifting from central office to the members, giving the membership a greater voice in community affairs
g. The traditional functions of religion are being taken by other agencies
    1) Government
    2) Private (others)
    3) Community
    4) Special interest groups

5. Economic Systems

a. Economic influence on socialization
    1) Hedonism, Epicurianism, etc.
    2) Private property theories
    3) Land theories, Capital theory
b. Theory of exploitation
c. Effect of combative economic systems on world economic resources which are limited
d. Media influences
e. Achievement of environmental quality through an alternative economic system
    1) Socialization
    2) Centralization of private wealth
    3) Wealth sharing

6. Political Systems

a. Political systems as agents for the socialization of the individual
    1) Sectional politics
    2) Representation of the individual
    3) Family alignment to political parties
    4) Introduction of the individual to political awareness
b. Political decision-making as it influences the environment of man
    1) Pressure on political offices by:
        a) Pressure groups
        b) Individual correspondence
        c) Demonstrations by generally unorganized groups
    2) Decision-making process
        a) Branches of local, state and national government
        b) Flow of decisions both up and down
c. Effect of communications media on political decisions
    1) Campaign speeches
    2) T.V. presentations
    3) News articles

d. Alternative political systems
   1) Way different "isms" make decisions
   2) Advantages of the different "isms" in making decisions
   3) Possible results from the decisions on environment of man

IMPACT OF POLITICAL SYSTEMS

OBJECTIVES

1. To define the parameters of the political system.
2. To define the functions of the political system insofar as they pertain to man and environment.
3. To describe the types of environmental problems found in different political systems.
4. To illustrate specific responses of political systems to environmental problems.
5. To examine the political system of the United States and how it has responded to environmental problems.
6. To examine alternative positive responses that could be effective in solving environmental problems in the United States.

OVERVIEW

All men live within a political system. Therefore, it is necessary to examine the parameters of the political system and the common functions performed by such systems. It then is necessary to examine and evaluate what different political systems have done to meet the challenges of specific environmental crises. A final objective of this Module is to examine the response of the United States' political system to environmental problems and to suggest alternative ways of responding to such problems.

UNITS

1. The Nature of Political Systems

   a. Common elements
   b. Unique elements

2. Political Systems and Environment

   a. Regulatory
   b. Public information
   c. Research and development

3. Comparative Environmental Problems (Suggested Case Studies)

   a. Water Pollution
      1) Rhine
      2) Thames
   b. Air Pollution
      1) Pittsburg
      2) London
      3) Tokyo
   c. Terrestrial Pollution
      1) Pakistan
      2) Viet Nam
      3) Imperial Valley

4. United States Response to Environmental Problems

   a. Legislative Responses
      1) Environmental Protection Act P.L. 91-190
      2) Environmental Education Act
   b. Executive Responses
      1) Presidential leadership
      2) Environmental Protection Agency
   c. Judicial Responses
      1) Use of existing statutes such as the Federal Refuse Act of 1899
      2) Citizen suits and standing before the courts (recent I.R.S. ruling)
   d. Special Interest Groups and their Influence on Political Sphere
      1) Traditional Conservation Groups
      2) New Environmental Groups
      3) Business and Labor
   e. State and Local Governmental Responses
      1) Traditional approaches
      2) New approaches
   f. The Community as a Source of Ecological Input

5. Alternative Responses for Solving Environmental Problems in the United States

   a. Community college as a catalyst for solving community environmental problems
   b. Citizen political action
      1) Self-education
      2) Community study groups
      3) Ecologically sound personal behavioral patterns
      4) Group action
   c. New governmental incentives
      1) Subsidies
      2) Taxing incentives
      3) Government reordering of priorities

IMPACT OF ECONOMIC SYSTEMS

OBJECTIVES

1. To understand the role that economic systems have in shaping man's perception of the environment.

2. To understand the impact of the three recognized economic systems on the environmemt: traditional, capitalist and command.

3. To understand the method used for resource allocation implied in each system to solve ecological problems.

4. To understand that there are long and short range cultural impacts impinging on each of the three basic economic systemsthat affect the ecology of a region.

5. To understand the impact of the three systems on solutions of international ecological problems.

OVERVIEW

While economic systems influence the way men think about environmental problems, these systems explain how different nations allocate resources to satisfy their wants and desires. However, resources are limited and rape of the landscape is an inefficient method of allocating resources, and avoids an attempt to confront environmental problems. The economic policies of different nations will affect the world eco-systems, and international bodies are developing an awareness of eco-problems.

UNITS

1. Man's Unlimited Wants Vs Limited Resources

   a. Wants, needs, desires
   b. Rising affluence
   c. Depletion of resources
   d. Inefficient use of resources
   e. Effect of resource base on standard of living

2. Explanation of Basic Economic Systems vs. Impact on the Environment

   a. Traditional --- i.e., Nepal
   b. Capitalistic --- U.S. - West Germany
   c. Command system --- Sweden
      China
      Yugoslavia

3. Implication of Various Economic Systems on Ecological Problems

   a. Traditional systems making small use of resource base
   b. Capitalism --- tendency to maximize use of resources for maximum private gain
   c. Command --- potentially allocates resources efficiently, but in actuality the errors are legion

4. Long and Short Range Impact on Environment o the Three Basic Systems

   a. Traditional --- North China
   b. Capitalistic --- American exploitation of land-west 100th meridian
   c. Command --- North Vietnam

5. Implication of Economic Systems on International Eco-problems

   a. International allocation bodies:U.N.,Commonwealth system, common markets, G.A.T.T.
   b. Movement of large scale capital influencing eco-problem:ie. international oil,steel, tropical fruit companies etc.

COMMUNICATION: DISSEMINATION AND ACQUISITION OF INFORMATION

OBJECTIVES

1. To evaluate the diffusion of information concerning ecological relationships.
2. To demonstrate the interrelationships of the various media.
3. To analyze the impact of various media.
4. To illustrate the potential of the media revolution on life styles.
5. To demonstrate how the "new communication" can influence ecologically viable life styles.
6. To consider the reorganization of media utilization and control.
7. To identify and implement new institutional forms.

OVERVIEW

Communication has, through its accelerated evolutionary sequence, intensified its impact on the environment and the individual. Contemporary and potential variations should be utilized to insure that acceptable life styles will be effected.

UNITS

1. Historical Context (Models)
   a. Language
   b. Writing
   c. Painting
   d. Electronic media

2. Exciting Media Utilization

   a. The paperback revolution
   b. The audio (records, tapes)
   c. The visual (films, T.V.)
   d. The cassette revolution

3. Potential Media Utilization

   a. Impact on the individual
   b. Impact at the local level
   c. National scope
   d. International implications

4. Implications of Media Use

   a. American representative institutions
      1) Social organization
      2) Educational
      3) Economic
      4) Religious - ethical
      5) Political
   b. Comparative representative institutions

THE ANTECEDENTS OF CONTEMPORARY PROBLEMS AND SOLUTIONS IN ECOLOGY

OBJECTIVES

1. To illustrate by contemporary examples the time-life web of mankind.
2. To give specific illustrations of man's view of nature.
3. To give specific illustrations of man's view of man.
4. To give specific illustrations of the relationship between man and nature.
5. To give specific illustrations of individuals leading new views of nature and man.

OVERVIEW

This module attempts to give a historical and cultural setting to contemporary ecological problems by stressing current social-political-religious manifestations of the eternal questions men have asked down through the centuries: Who am I? Where did I come from? and Where am I going? This module attempts to highlight, through specific historical and cultural examples, man's changing view of nature, his evolving concept of man's transition from Hunting to Agricultural and finally to Scientific-Technological Stages.

The perceived interrelationships between man viewing nature and man viewing man are viewed as a synthesis manifesting itself in terms of Mythology, Religion, Ethics, Science, Technology, Socio-Political-Economics. A new reordering of man's interrelationships within a finite, closed earth system is suggested by identifying contemporary leaders in this new area.

UNITS

1. Crosscurrents in the Contemporary Scene

   a. Differences in student's awareness of environmental problems
   b. Sub-culture, astrology, minority demands as evidence of cross-currents

2. Man's View of Nature

   a. The hostile natural environment
   b. Nature as a bountiful provider
   c. Rape of nature for personal gain

3. Man's View of Man

   a. Man the hunter
   b. Man the farmer
   c. Man the scientist-technologist

4. The Relationship of Man and Nature

   a. Faith
   b. Religion
   c. Ethics
   d. Science
   e. Technology
   f. Socio-economics
   g. Politics

5. Toward a New Awareness of Man and Nature

   a. Leading thinkers
   b. New movements

MODULE 31:
INDIVIDUAL INVOLVEMENT

At this juncture, it is recommended that the module Individual Involvement (Module #17 in the first semester) be repeated.

This is the fourth module from the first semester to be repeated in the second semester. However, the other three are recommended only for review. This module should be handled in about the same detail as occurred in the first semester, although instructors may well want to vary certain points of emphasis or use different types of illustrative material.

A complete outling of this module is given in the section devoted to the first semester.

INDIVIDUAL INVOLVEMENT

OBJECTIVES

1. To survey specific environmental problems.
2. To study existing environmental conditions, and evaluate the quality.
3. To plan and evaluate theoretical models related to appropriate courses of action.
4. To implement the plan of action.
5. To evaluate the effectiveness of the actions taken.

OVERVIEW

This Module is intended to present the student with the guidelines by which he addresses himself to a specific problem and charges him with applying the knowledge acquired in this segment of the course, in our effort to improve the environmental condition. He is directed in such a way as to apply the scientific method to the problem, thus providing a logical frame of reference in which to work.

UNITS

1. Identification of Environmental Problems
   - a. Local involvement
   - b. Regional involvement
   - c. National movements
2. Selection of a Problem
   - a. Determining the contributing factors
   - b. Establishment of the optimum condition

3. Course of Action

   a. Research and development
   b. Awareness education
   c. Ballot box
   d. Due process of law
   e. Lobbying
   f. Boycott
   g. Confrontation

4. Engagement

   a. Application of the course of action to the actual problem

5. Evaluation of Course of Action

   a. Collection and analysis of data
   b. Interpretation
   c. Conclusions
   d. Summary
   e. Recommendations

RESPONSIBILITY TO FUTURE GENERATIONS

OBJECTIVE

To propose a design for a new humane environment which defines an "optimum quality of life".

OVERVIEW

The module is designed to present the quandary of survival versus non-survival.

In consideration of all modules presented in the course, an attempt is made to develop a concept of intellectual tools for the future. It is intended that these tools will be carried by (future) generations and utilized by them in their struggle to establish an optimum human environment.

UNITS

1. Non-Survival vs. Survival

    a. Non-survival
        1) Establish a clear understanding that non-survival is one of two possible directions that we will take
    b. Survival
        1) Discussion of possible alternatives

2. Tools For an Uncertain Future

    a. Examination of an optimum quality of life, including the concept of self within a framework of environmental interdependence for succeeding generations
    b. A review of the tools as suggested throughout the course
    c. A discussion of what the new human environment (culture?) might be like. This is to include an ecological ethic.

SPECIAL NOTE

DISPOSAL OF WASTES

At the time of the most recent workshop concerned with developing this curriculum, participants devoted themselves solely to the original list of modules developed at the original workshop held in May, 1970. At the same time, they reviewed suggestions for additional modules which might be added to this course.

As a result, it is evident that many participants agree that one additional module should be added. This would center about the disposal of waste materials, an extremely wide-spread problem which is becoming of increasing concern to residents of this country.

Unfortunately, there was no time available for the development of this module during this most recent workshop. It is very likely that such a module will be added when any further revisions of this course are undertaken, and --- because of the widely recognized importance of the subject --- it is possible that instructors using this course may wish to use materials along these lines or to develop independently a separate module relating to this subject.